

Serial Number: 09/846,808

**ENTERED**

- ☐ Changed a file from non-ASCII to ASCII
- ☐ Changed the margins in cases where the sequence text was "wrapped" down to the next line.
- ☐ Edited a format error in the Current Application Data section, specifically: \_\_\_\_\_
- ☐ Edited the Current Application Data section with the actual current number. The number inputted by the applicant was ☐ the prior application data; or ☐ other \_\_\_\_\_
- ☐ Added the mandatory heading and subheadings for "Current Application Data".
- ☐ Edited the "Number of Sequences" field. The applicant spelled out a number instead of using an integer.
- ☐ Changed the spelling of a mandatory field (the headings or subheadings), specifically: \_\_\_\_\_
- ☐ Corrected the SEQ ID NO when obviously incorrect. The sequence numbers that were edited were: \_\_\_\_\_
- ☐ Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited: \_\_\_\_\_
- ☐ Corrected subheading placement. All responses must be on the same line as each subheading. If the applicant placed a response below the subheading, this was moved to its appropriate place.
- ☐ Inserted colons after headings/subheadings. Headings edited included: \_\_\_\_\_
- ☐ Deleted extra, invalid, headings used by an applicant, specifically: \_\_\_\_\_
- ☐ Deleted: ☐ non-ASCII "garbage" at the beginning/end of files; ☐ secretary initials/filename at end of file; ☐ page numbers throughout text; ☐ other invalid text, such as \_\_\_\_\_
- ☐ Inserted mandatory headings, specifically: \_\_\_\_\_
- ☐ Corrected an obvious error in the response, specifically: \_\_\_\_\_
- ☐ Edited identifiers where upper case is used but lower case is required, or vice versa.
- ☐ Corrected an error in the Number of Sequences field, specifically: \_\_\_\_\_
- ☐ A "Hard Page Break" code was inserted by the applicant. All occurrences had to be deleted.
- ☐ Deleted *ending* stop codon in amino acid sequences and adjusted the "(A)Length:" field accordingly (error due to a PatentIn bug). Sequences corrected: \_\_\_\_\_
- ☒ Other: *Seq 7 - corrected amino acid nos.*

\*Examiner: The above corrections must be communicated to the applicant in the first Office Action. DO NOT send a copy of this form.

## RAW SEQUENCE LISTING

DATE: 05/27/2001

PATENT APPLICATION: US/09/846,808

TIME: 16:38:42

Input Set : A:\Pto.amc

Output Set: C:\CRF3\05272001\I846808.raw

3 <110> APPLICANT: Walker, David H.  
 4 Yu, Xu-Jie  
 6 <120> TITLE OF INVENTION: Ehrlichia chaffeensis 28 kDa Outer Membrane  
 7 Protein Multigene Family  
 9 <130> FILE REFERENCE: D6311  
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 11 <141> CURRENT FILING DATE: 2001-05-01  
 13 <150> PRIOR APPLICATION NUMBER: 60/201,035  
 14 <151> PRIOR FILING DATE: 2000-05-01  
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 21 <213> ORGANISM: Ehrlichia chaffeensis  
 23 <220> FEATURE:  
 24 <223> OTHER INFORMATION: P28-1 Outer Membrane Protein of  
 25 Ehrlichia chaffeensis  
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 33 20 25 30  
 35 His Asn Ser Met Tyr Val Gly Ile Gln Tyr Lys Pro Ala Arg Gln  
 36 35 40 45  
 38 His Leu Ser Lys Leu Leu Ile Lys Glu Ser Ala Ala Asn Thr Val  
 39 50 55 60  
 41 Glu Val Phe Gly Leu Lys Lys Asp Leu Leu Asn Asp Leu Leu Thr  
 42 65 70 75  
 44 Gly Ile Lys Asp Asn Thr Asn Phe Asn Ile Lys Tyr Asn Pro Tyr  
 45 80 85 90  
 47 Tyr Glu Asn Asn Arg Leu Gly Phe Ser Gly Ile Phe Gly Tyr Tyr  
 48 95 100 105  
 50 Tyr Asn Lys Asn Phe Arg Ile Glu Ser Glu Leu Ser Tyr Glu Thr  
 51 110 115 120  
 53 Phe His Ile Lys Asn Asn Gly Tyr Lys Arg Ile Asp Cys Glu Lys  
 54 125 130 135  
 56 His Phe Ala Leu Ala Lys Glu Ile Ser Gly Gly Ser Asn Asn Pro  
 57 140 145 150  
 59 Ala Asn Asn Lys Tyr Val Thr Leu Ile Asn Asn Gly Ile Ser Leu  
 60 155 160 165  
 62 Thr Ser Ala Leu Ile Asn Val Cys Tyr Asp Val Asp Gly Leu Lys  
 63 170 175 180  
 65 His Asn Ile Ile Thr Tyr Ser Cys Leu Gly Phe Gly Val Asp Thr  
 66 185 190 195  
 68 Ile Asp Phe Leu Ser Lys Tyr Thr Thr Lys Phe Ser Tyr Gln Gly  
 69 200 205 210  
 71 Lys Leu Gly Ala Ser Tyr Thr Val Ser Pro Gln Val Ser Val Phe

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/846,808

DATE: 05/27/2001

TIME: 16:38:42

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75          230          235          240
77 Ile Pro Val Asn Tyr Pro Cys Asp Tyr Pro Ser Pro Thr Pro Pro
78          245          250          255
80 Asn Ser Lys Pro His Val His Thr Thr Ala Leu Ala Met Leu Ser
81          260          265          270
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93 <223> OTHER INFORMATION: P28-2 Outer Membrane Protein of
94   Ehrlichia chaffeensis
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101          20          25          30
103 Asp Asn Ile Gly His Phe Tyr Ile Gly Gly Gln Tyr Lys Pro Gly
104          35          40          45
106 Val Pro Arg Phe Asn Arg Phe Leu Val Thr Asn Asn Asn Ile Arg
107          50          55          60
109 Glu Leu Met Ser Ser Asp Glu Glu Cys Arg Ser Thr Ile Pro His
110          65          70          75
112 Met Val Gln Ser Val Ala Gln Gly Thr Leu Pro Pro Glu Ala Leu
113          80          85          90
115 Glu Glu Leu Ala Asp Gly Lys Phe Pro Glu Gly Tyr Leu Tyr Phe
116          95          100          105
118 Thr Ile Pro Tyr Asn Pro Thr Tyr Lys Lys Asn Leu Leu Gly Ala
119          110          115          120
121 Gly Gly Val Ile Gly Tyr Ser Thr Thr His Phe Arg Val Glu Val
122          125          130          135
124 Glu Ala Phe Tyr Asp Lys Phe Asn Leu Thr Ala Pro Ala Gly Tyr
125          140          145          150
127 Leu His Lys Asn Phe Tyr Glu Tyr Phe Ala Leu Ala Thr Thr Met
128          155          160          165
130 Asp Thr Lys His Pro His Gln Ser Ala Glu Asp Lys Tyr Tyr Tyr
131          170          175          180
133 Met Lys Asn Thr Gly Ile Thr Leu Ser Pro Phe Ile Ile Asn Ala
134          185          190          195
136 Cys Tyr Asp Phe Ile Leu Lys Lys Thr Arg Asn Val Ala Pro Tyr
137          200          205          210
139 Leu Cys Leu Gly Val Gly Gly Asn Phe Ile Asp Phe Leu Asp Gln
140          215          220          225
142 Val Ser Phe Lys Phe Ala Tyr Gln Ala Lys Val Gly Ile Ser Tyr
143          230          235          240

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## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/846,808

DATE: 05/27/2001

TIME: 16:38:42

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Output Set: C:\CRF3\05272001\I846808.raw

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146                               245                250                255
148 Gly His Leu Asn Asn Gln Phe Ser Asp Ser Pro Val Val Asp Tyr
149                               260                265                270
151 Ser Ser Ser Gly Phe Pro Thr Ile Ser Ala Lys Phe Asn Ala Asn
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155                               290                295
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162 <220> FEATURE:
163 <223> OTHER INFORMATION: P28-3 Outer Membrane Protein of
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166 <400> SEQUENCE: 3
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168                               5                10                15
170 Leu Pro Lys Tyr Val Phe Cys Met His Gln Asn Asn Asn Ile Asp
171                               20                25                30
173 Gly Ser Tyr Val Thr Ile Lys Tyr Gln Leu Thr Thr Pro His Phe
174                               35                40                45
176 Lys Asn Phe Tyr Ile Lys Glu Thr Asp Phe Asp Thr Gln Glu Pro
177                               50                55                60
179 Ile Gly Leu Ala Lys Ile Thr Ala Asn Thr Lys Phe Asp Thr Leu
180                               65                70                75
182 Lys Glu Asn Phe Ser Phe Ser Pro Leu His Gln Thr Asp Ser Tyr
183                               80                85                90
185 Lys Ser Tyr Gln Asn Asp Leu Leu Gly Ile Gly Leu Ser Val Gly
186                               95                100               105
188 Leu Phe Val Lys Ser Phe Arg Ile Glu Phe Glu Gly Ala Tyr Lys
189                               110               115               120
191 Asn Phe Asn Thr Lys Arg Leu Ala Arg Tyr Lys Ser Lys Asp Gly
192                               125               130               135
194 Tyr Lys Tyr Phe Ala Ile Pro Arg Lys Ser Glu His Gly Phe Leu
195                               140               145               150
197 Asp Asn Thr Phe Gly Tyr Thr Val Ala Lys Asn Asn Gly Ile Ser
198                               155               160               165
200 Ile Ile Ser Asn Ile Ile Asn Leu Cys Ser Glu Thr Lys Tyr Lys
201                               170               175               180
203 Ser Phe Thr Pro Tyr Ile Cys Ile Gly Val Gly Gly Asp Phe Ile
204                               185               190               195
206 Glu Ile Phe Asp Val Met Arg Ile Lys Phe Ala Tyr Gln Gly Lys
207                               200               205               210
209 Val Gly Val Ser Tyr Pro Ile Thr Ser Lys Leu Ile Leu Ser Ile
210                               215               220               225
212 Asn Gly Gln Tyr His Lys Val Ile Gly Asn Lys Phe Glu Leu Leu
213                               230               235               240
215 Pro Val Tyr Gln Pro Val Glu Leu Lys Arg Leu Val Thr Asn Lys

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## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/846,808

DATE: 05/27/2001

TIME: 16:38:42

Input Set : A:\Pto.amc

Output Set: C:\CRF3\05272001\I846808.raw

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218 Thr Ser Lys Asp Ile Asp Gln Asp Val Thr Ala Ser Leu Thr Leu
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222          275          280          285
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230 <223> OTHER INFORMATION: P28-4 Outer Membrane Protein of
231     Ehrlichia chaffeensis
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238          20          25          30
240 Ala Leu Ile Gly Asn Val Glu Lys Asp Leu Lys Val Ser Ser Thr
241          35          40          45
243 Tyr Val Ser Ser Gln Tyr Lys Pro Ser Ile Phe His Phe Arg Asn
244          50          55          60
246 Phe Ser Ile Gln Glu Ser His Pro Lys Lys Ser Ser Glu Glu Phe
247          65          70          75
249 Lys Lys Ile Lys Ala Asn Leu Asn Asn Ile Leu Lys Ser Asn Ala
250          80          85          90
252 Tyr Asn Leu Gln Phe Gln Asp Asn Thr Thr Ser Phe Ser Gly Thr
253          95          100          105
255 Ile Gly Tyr Phe Ser Lys Gly Leu Arg Leu Glu Ala Glu Gly Cys
256          110          115          120
258 Tyr Gln Glu Phe Asn Val Lys Asn Ser Asn Asn Ser Leu Ile Ile
259          125          130          135
261 Ser Ser Asn Lys Tyr His Ser Arg Ile His Asp Glu Asn Tyr Ala
262          140          145          150
264 Ile Thr Thr Asn Asn Lys Leu Ser Ile Ala Ser Ile Met Val Asn
265          155          160          165
267 Thr Cys Tyr Asp Ile Ser Ile Asn Asn Thr Ser Ile Val Pro Tyr
268          170          175          180
270 Leu Cys Thr Gly Ile Gly Glu Asp Leu Val Gly Leu Phe Asn Thr
271          185          190          195
273 Ile His Phe Lys Leu Ala Tyr Gln Gly Lys Val Gly Met Ser Tyr
274          200          205          210
276 Leu Ile Asn Asn Asn Ile Leu Leu Phe Ser Asp Ile Tyr Tyr His
277          215          220          225
279 Lys Val Met Gly Asn Arg Phe Lys Asn Leu Tyr Met Gln Tyr Val
280          230          235          240
282 Ala Asp Pro Asn Ile Ser Glu Glu Thr Ile Pro Ile Leu Ala Lys
283          245          250          255
285 Leu Asp Ile Gly Tyr Phe Gly Ser Glu Ile Gly Ile Arg Phe Met
286          260          265          270

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## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/846,808

DATE: 05/27/2001

TIME: 16:38:42

Input Set : A:\Pto.amc

Output Set: C:\CRF3\05272001\I846808.raw

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295 <220> FEATURE:
296 <223> OTHER INFORMATION: P28-5 Outer Membrane Protein of
297     Ehrlichia chaffeensis
299 <400> SEQUENCE: 5
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304 Leu Phe Leu Phe Pro Leu Lys Ser Phe Thr Thr Tyr Ala Asn Asn
305                      20                      25                      30
307 Asn Thr Ile Thr Gln Lys Val Gly Leu Tyr Ile Ser Gly Gln Tyr
308                      35                      40                      45
310 Lys Pro Ser Ile Pro His Phe Lys Asn Phe Ser Val Glu Glu Asn
311                      50                      55                      60
313 Asp Lys Val Val Asp Leu Ile Gly Leu Thr Thr Asp Val Thr Tyr
314                      65                      70                      75
316 Ile Thr Glu His Ile Leu Arg Asp Asn Thr Lys Phe Asn Thr His
317                      80                      85                      90
319 Tyr Ile Ala Lys Phe Lys Asn Asn Phe Ile Asn Phe Ser Ser Ala
320                      95                      100                     105
322 Ile Gly Tyr Tyr Ser Gly Gln Gly Pro Arg Leu Glu Ile Glu Ser
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325 Ser Tyr Gly Asp Phe Asp Val Val Asn Tyr Lys Asn Tyr Ala Val
326                      125                     130                     135
328 Gln Asp Val Asn Arg Tyr Phe Ala Leu Val Arg Glu Lys Asn Gly
329                      140                     145                     150
331 Ser Asn Phe Ser Pro Lys Pro His Glu Thr Ser Gln Pro Ser Asp
332                      155                     160                     165
334 Ser Asn Pro Lys Lys Ser Phe Tyr Thr Leu Met Lys Asn Asn Gly
335                      170                     175                     180
337 Val Phe Val Ala Ser Val Ile Ile Asn Gly Cys Tyr Asp Phe Ser
338                      185                     190                     195
340 Phe Asn Asn Thr Thr Ile Ser Pro Tyr Val Cys Ile Gly Val Gly
341                      200                     205                     210
343 Gly Asp Phe Ile Glu Phe Phe Glu Val Met His Ile Lys Phe Ala
344                      215                     220                     225
346 Cys Gln Ser Lys Val Gly Ile Ser Tyr Pro Ile Ser Pro Ser Ile
347                      230                     235                     240
349 Thr Ile Phe Ala Asp Ala His Tyr His Lys Val Ile Asn Asn Lys
350                      245                     250                     255
352 Phe Asn Asn Leu His Val Lys Tyr Ser Tyr Glu Leu Lys Asn Ser
353                      260                     265                     270
355 Pro Thr Ile Thr Ser Ala Thr Ala Lys Leu Asn Ile Glu Tyr Phe
356                      275                     280                     285
358 Gly Gly Glu Val Gly Met Arg Phe Ile Phe
359                      290                     295

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## VERIFICATION SUMMARY

PATENT APPLICATION: US/09/846,808

DATE: 05/27/2001

TIME: 16:38:43

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## VERIFICATION SUMMARY

PATENT APPLICATION: US/09/846,808

DATE: 05/27/2001

TIME: 16:38:43

Input Set : A:\Pto.amc

Output Set: C:\CRF3\05272001\I846808.raw

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OIPE

RAW SEQUENCE LISTING  
 PATENT APPLICATION: US/09/846,808

DATE: 05/16/2001  
 TIME: 15:37:17

Input Set : A:\6311SEQ.txt  
 Output Set: N:\CRF3\05162001\I846808.raw

**Does Not Comply  
 Corrected Diskette Needed**

3 <110> APPLICANT: Walker, David H.  
 4 Yu, Xu-Jie  
 6 <120> TITLE OF INVENTION: Ehrlichia chaffeensis 28 kDa Outer Membrane  
 7 Protein Multigene Family  
 9 <130> FILE REFERENCE: D6311  
 W--> 11 <140> CURRENT APPLICATION NUMBER: US/09/846,808  
 11 <141> CURRENT FILING DATE: 2001-05-01  
 13 <150> PRIOR APPLICATION NUMBER: 60/201,035  
 14 <151> PRIOR FILING DATE: 2000-05-01  
 16 <160> NUMBER OF SEQ ID NOS: 53

#### ERRORED SEQUENCES

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 429 <211> LENGTH: 283  
 430 <212> TYPE: PRT  
 431 <213> ORGANISM: Ehrlichia chaffeensis  
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 434 <223> OTHER INFORMATION: P28-7 Outer Membrane Protein of  
 435 Ehrlichia chaffeensis  
 437 <400> SEQUENCE: 7  
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 442 20 25 30  
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 445 35 40 45  
 447 Gln Tyr Lys Pro Thr Val Ser His Phe Ser Asn Phe Ser Leu Lys  
 448 50 55 60  
 450 Glu Thr Tyr Thr Asp Thr Lys Glu Leu Leu Gly Leu Ala Lys Asp  
 451 65 70 75  
 453 Ile Lys Ser Ile Thr Asp Ile Thr Thr Asn Lys Lys Phe Asn Ile  
 454 80 85 90  
 456 Pro Tyr Asn Thr Lys Phe Gln Asp Asn Ala Val Ser Phe Ser Ala  
 457 95 100 105  
 459 Ala Val Gly Tyr Ile Ser Gln Asp Ser Pro Arg Val Glu Val Glu  
 460 110 115 120  
 462 Trp Ser Tyr Glu Glu Phe Asp Val Lys Asn Pro Gly Asn Tyr Val  
 463 125 130 135  
 465 Val Ser Glu Ala Phe Arg Tyr Ile Ala Leu Ala Arg Gly Ile Asp  
 466 140 145 150  
 468 Asn Leu Gln Lys Tyr Pro Glu Thr Asn Lys Tyr Val Val Ile Lys  
 469 155 160 165  
 471 Asn Asn Gly Leu Ser Val Ala Ser Ile Ile Ile Asn Gly Cys Tyr  
 472 170 175 180  
 474 Asp Phe Ser Leu Asn Asn Leu Lys Val Ser Pro Tyr Ile Cys Val

## RAW SEQUENCE LISTING

DATE: 05/16/2001

PATENT APPLICATION: US/09/846,808

TIME: 15:37:17

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Output Set: N:\CRF3\05162001\I846808.raw

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481          215          220          225
483 Ser Asn Met Ile Ile Phe Ala Asp Gly Tyr Tyr His Lys Val Ile
484          230          235          240
486 Gly Asn Lys Phe Asn Asn Leu Asn Val Gln His Val Val Ser Leu
487          245          250          255
489 Asn Ser His Pro Lys Ser Thr Phe Ala Val Ala Thr Leu Asn Val
490          260          265          270
492 Glu Tyr Phe Gly Ser Glu Phe Gly Leu Lys Phe Ile Phe
493          275          280

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VERIFICATION SUMMARY  
PATENT APPLICATION: US/09/846,808

DATE: 05/16/2001  
TIME: 15:37:18

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L:1594 M:283 W: Missing Blank Line separator, <220> field identifier  
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L:1604 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1607 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1615 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1618 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1625 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1628 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1635 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1638 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1646 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1657 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1660 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1667 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1670 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1677 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1680 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1688 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1691 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1698 M:283 W: Missing Blank Line separator, <220> field identifier

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/846,808

DATE: 05/16/2001

TIME: 15:37:18

Input Set : A:\6311SEQ.txt

Output Set: N:\CRF3\05162001\I846808.raw

L:1701 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1708 M:283 W: Missing Blank Line separator, <220> field identifier  
L:1711 M:283 W: Missing Blank Line separator, <400> field identifier  
L:1722 M:283 W: Missing Blank Line separator, <400> field identifier